

than is supposed but is mistaken for *C. Lutetiana*, which it so closely resembles.—F. H. BURGLEHAUS.

THE MIGNONETTE AS CLASS ILLUSTRATION FOR ASCENT OF SAP.—The garden mignonette when in flower is a suitable plant with which to test the upward flow of liquid in cut stems, and by means of it, when the inflorescence is many inches long, the rate of ascent may, in some measure, be obtained without destroying the stem. This is because the petals are delicately fringed with white, and into these the liquid will pass and quickly show a beautiful color, whether blue, red, or other that may be used. The fine somewhat spatulate lobes of the corolla will first show the color in the main vein, but shortly after it will increase and become diffused throughout all the middle of the lobe, the outermost and purely cellular portion being the last to be tinged. Methyl-blue has proved the most striking color for class illustration.—BYRON D. HALSTED.

A RARE PLANT FROM WESTERN TEXAS.—Last summer, when collecting in western Texas, I found a parasite on *Dalea formosa*, which I took first, after a careless examination, for a *Cuscuta*. But in the winter, when I studied my plants from western Texas more carefully, I found that it was a very different plant and was more related to the Loranthaceae than to anything else. Lately I purchased the *Plantae Novae Thurberianae* and here I found my plant described by Dr. Asa Gray as *Pilostyles Thurberi* (now *Apodanthes Thurberi* B. & H.). This plant is the only representative of the Rafflesiaceae in the United States. It was first collected by Mr. Thurber on *Dalea Emoryi*, along the Gila River, in western Arizona.—HENRY EGGERT.

## REVIEWS

### THE GENUS LYCOPodium: A CRITICISM

BY FRANCIS E. LLOYD

The part of Engler and Prantl's *Die natürlichen Pflanzenfamilien* dealing with the Lycopodiaceae \* has lately appeared, and

\* E. Pritzel. Lycopodiaceae. Engler & Prantl, *Die natürlichen Pflanzenfamilien* 1<sup>4</sup>: 563-606. 1900.

the treatment there given to the genus *Lycopodium* by Pritzel is open to some criticism concerning certain matters, both of fact and of opinion.

Under Section V. *Clavata*, there are given two subsections characterized as follows :

A. Leaves of one sort, shoots externally radial in structure.

B. Shoots bilateral, often flattened. Leaves in 4-8 rows, of two kinds, the lateral flat, upwardly curved, spreading, broadly emarginate, the upper and lower smaller, linear and appressed.

The species found in North America which are placed under the former are *Lycopodium annotinum*, *L. alpinum*, *L. sabinaefolium*, *L. Sitchense* and *L. clavatum*. Of these, the first and the last two are undoubtedly to be placed in this category, a statement which cannot apply to the other two, namely, *L. alpinum* and *L. sabinaefolium*. *L. sabinaefolium* has been for many years confused with *L. Sitchense*, but the two differ, among other respects, in that the former has a dorsiventral structure with leaves on the ultimate aërial branches always in four rows, while the ultimate branches of *L. Sitchense* are of radial structure with leaves in five rows.

*L. alpinum*, on the other hand, has a most distinct and easily recognizable bilaterality in its twigs. The leaves of this plant are indeed of three forms ; those of the upper row are "narrowly ovate, acute, those of the lateral rows thick, with one asymmetrically placed nerve, laterally truncate, acute, falcate, curved toward the under side, those of the under side trowel-shaped."\*

In view of these differences, *Lycopodium sabinaefolium* and *L. alpinum* should be placed with *L. complanatum* and *L. Chamaecyparissus*, the propriety of which is practically admitted by Pritzel. Speaking of *L. Fawcettii* and *L. Wightianum* he says: "The latter plants evidently form a transition to the doubtless nearly related *L. alpinum*, to which all these species stand closely related." If we place these species in Section B of Pritzel, we should then have a series of North American forms which show as many degrees of divergence from a more primitive type.

\* Lloyd, F. E., and Underwood, L. M. A Review of the Species of *Lycopodium* in North America. Bull. Torr. Club, 27 : 147-168. 21 Ap. 1900.

Such a type probably resembled *Lycopodium sabinaefolium*, rather than *L. alpinum*, as Pritzel suggests, for the latter on account of the trimorphism of its leaves and remarkably developed dorsiventrality forms a species of extreme divergence, while *L. sabinaefolium* has a far more generalized form. Of the radially symmetrical species, *L. Sitchense* would justly claim to lie close to the original form from which the dorsiventral plants under discussion have arisen.

The degrees of specialization seen in the North American continental species may be expressed in the following linear series: *Lycopodium sabinaefolium*, *L. Chamaecyparissus*, *L. complanatum* and *L. alpinum*.

Referring to the diagnosis of Section B, it may further be pointed out that the leaves of the upper and lower rows are not always appressed. The upper ones in *L. alpinum* and the lower ones in *L. Chamaecyparissus* are indeed so. In *L. complanatum* and *L. sabinaefolium* the leaves of both upper and under rows are spreading.

Under Section B, Pritzel places *Lycopodium complanatum* and *L. Farwettii* with *L. Chamaecyparissus* as a variety of *L. complanatum*. The relation of these two last named plants has been heretofore a matter of doubt, but the facts which have already been set forth\* would seem fairly to settle the question so far as North America is concerned.† Here the two plants may be found growing in exactly the same habitat, but still differing anatomically, in external features and in physiological characters. The more obvious characters of the species *L. complanatum* are seen in the ultimate shoots which are distinctly plagiotropous, much flattened dorsiventrally, with leaves of the under row much reduced, spreading, and not emarginate. The rhizome is above ground. The spores ripen at least as much as four weeks later than those of *L. Chamaecyparissus*, which has

\* Lloyd, F. E. Two hitherto confused species of *Lycopodium*. Bull. Torr. Club, 26: 559-567. 15 N. 1899.

† While at Kew during the past summer I saw the type of *Lycopodium tristachyum* Pursh, Fl. Am. Sept. 2: 653. 1814, and find that it is exactly the species separated by Al. Braun many years later as *L. Chamaecyparissus*. The earlier name will therefore replace the later and another of Pursh's species can be justified.—L. M. UNDERWOOD.

orthotropous annually innovating branchlets, a much less pronounced dorsiventrality, evidently emarginate, appressed under leaves and an underground rhizome. No intermediate conditions were found to reward a diligent and repeated search on the part of two observers over an acre of ground where both plants were growing side by side in great abundance. One is therefore irresistibly driven to the conclusion, no matter what view may be taken of the question of species, that here at least are distinct plants which must be completely separated in order satisfactorily to recognize their differences.

Finally, the authorities for *Lycopodium Fawcettii* and *L. porophilum* are quoted incorrectly. It would appear that there is but one alternative in such matters, either to leave the authority out altogether or to give it correctly.

#### NEWS ITEMS

William Austin Cannon, A.M. (Stanford University), has been reappointed Fellow in Botany in Columbia University. Mr. Cannon is making a special study of certain features of hybridization in plants.

Mr. Jared G. Smith, of the U. S. Department of Agriculture, has gone to Honolulu to assume the directorship of the Hawaiian Agricultural Experiment Station.

Mr. Roland M. Harper, graduate student in the Botanical Department of Columbia University, is temporarily in Washington, D. C., as special assistant in the United States National Herbarium.

Professor William F. Ganong's paper, entitled "Suggestions for an Attempt to secure a standard College Entrance Option in Botany," read before the Society for Plant Morphology and Physiology at the Baltimore meeting, December 28, 1900, is published in *Science* for April 19, 1901.

A suggestive contribution to the literature bearing upon questions of nomenclature is "The Determination of the Type in composite Genera of Animals and Plants," by President David Starr Jordan, printed in *Science* for March 29, 1901.